

1. A cable-drive modular motion unit for effecting one axis of motion of a multi-axis positioning device, comprising:

- a base structure;
- a linear guide attached to said base structure, said linear guide having a major axis aligned with said one axis of motion;
- a carriage arranged on said linear guide such that motion of said carriage is limited to being along said major axis;
- a drive motor attached to said base structure; and
- a cable attached to said carriage and said drive motor such that rotation of said drive motor causes movement of said carriage, wherein, during operation of said multi-axis positioning device, said cable moves independently of any portion of said multi-axis positioning device that moves in an axis of motion other than said one axis of motion.

2. The cable-drive modular motion unit of claim 1, further comprising:

a linear channel along which a tensioner plate travels;

said tensioner plate attached with one end of said cable

wherein movement in a first direction increases tension on said cable and movement in a second direction decreases tension on said cable;

a spring having a first fixed end and a second end operationally coupled with said tensioner plate, said spring being compressed so as to exert a force in said first direction; and

a releasable lock attached to said tensioner plate and configured, in a first position, to prevent said tensioner plate from moving and, in a second position, to permit said tensioner plate to move; whereby when said releasable lock is in said second position, said spring effects movement of said tensioner plate in said first direction.

3. The cable-drive modular motion unit of claim 2, wherein said releasable lock is configured to be changed between said first and second positions with a conventional tool.

4. The cable-drive modular motion unit of claim 1, wherein said drive motor is located on said base structure opposite said carriage.

5. A positioning device, comprising:
- a first modular motion unit, comprising:
    - a first base structure;
    - a first linear guide attached to said first base structure, said first linear guide having a first major axis aligned with a first axis of motion;
    - a first carriage arranged on said first linear guide such that motion of said first carriage is limited to being along said first major axis;
    - a first drive motor attached to said first base structure, and
    - a first cable attached to said first carriage and said first drive motor such that rotation of said first drive motor causes movement of said first carriage; and
  - a second modular motion unit, comprising:
    - a second base structure;
    - a second linear guide attached to said second base structure, said second linear guide having a second major axis aligned with a second axis of motion;
    - a second carriage arranged on said second linear guide such that motion of said second carriage is limited to being along said second major axis;
    - a second drive motor attached to said second base structure, and

a second cable attached to said second carriage and said second drive motor such that rotation of said second drive motor causes movement of said second carriage independent from movement of said first carriage.

6. The positioning device of claim 5, wherein said first axis of motion and said second axis of motion are substantially orthogonal to one another.

7. The positioning device of claim 5, further comprising:  
a frame on which said first modular motion unit and said second modular motion unit are operatively coupled.

8. A tensioning device for a cable of a cable drive system, comprising:

- a tensioner plate;
- a linear channel along which said tensioner plate travels;
- said tensioner plate configured for attachment with one end of said cable wherein movement of said tensioner plate in a first direction increases tension on said cable and movement in a second direction decreases tension on said cable;
- a spring having a first fixed end and a second end operationally coupled with said tensioner plate, said spring being compressed so as to exert a force in said first direction; and
- a releasable lock attached to said tensioner plate and configured, in a first position, to prevent said tensioner plate from moving and, in a second position, to permit said tensioner plate to move; whereby when said releasable lock is in said second position, said spring effects movement of said tensioner plate in said first direction.

9. The tensioning device of claim 8, wherein said releasable lock is configured to be changed between said first and second positions with a conventional tool.

10. The tensioning device of claim 8, further comprising:

- a spring stop located at least partially within said linear channel adjacent to said first fixed end.

11. The tensioning device of claim 8, wherein said releasable lock comprises:

a first portion configured to be positioned outside of said linear channel;

a second portion configured to be positioned within said linear channel; and

a connector configured to releasably couple said first portion to said second portion.

12. The tensioning device of claim 11, wherein said second portion further includes one or more bearings configured to engage an inside of said linear channel.

13. A method for tensioning a cable of a cable drive system, comprising the steps of:

attaching one end of the cable to a movable tensioner plate, wherein movement in a first direction increases tension on the cable and movement in a second direction decreases tension on the cable;

locking the movable tensioner plate in a first fixed position;

arranging a spring against said movable tensioner plate such that a force of the spring acts on the movable tensioner plate in the first direction;

releasing the movable tensioner plate from the first fixed position thereby allowing the spring to move the movable tensioner plate, in the first direction, to a second position; and

locking the movable tensioner plate at the second position.

14. The method of claim 13, wherein the step of releasing further includes the step of:

using a conventional tool to release the movable tensioner plate.

15. The method of claim 13, wherein the step of locking the movable tensioner plate at the second position, further includes the step of:

using a conventional tool to lock the movable tensioner plate.

16. A method for providing movement in a multi-axis positioning device comprised of a plurality of modular motion units, the method comprising the steps of:

orienting, along a first axis of motion, a first modular motion unit on a frame, the first modular motion unit comprising a first motor, a first cable, and a first carriage operatively coupled together;

orienting, along a second axis of motion, a second modular motion unit on the frame, the second modular motion unit comprising a second motor, a second cable, and a second carriage operatively coupled together;

energizing the first motor so as to cause the first cable to move the first carriage along the first axis of motion; and

energizing the second motor so as to cause the second cable to move the second carriage along the second axis of motion, wherein the movement of the second carriage occurs independent from the movement of the first carriage.

17. The method of claim 16, wherein the first cable and the second cable are unconnected to one another.

18. The method of claim 16, further comprising the step of: arranging a third modular motion unit on the base structure to provide motion in a third axis, wherein the third modular motion unit operates independently of the first and second modular motion units.



19. The method of claim 16, wherein the first axis is substantially orthogonal to the second axis.